

CLEAN VERSION OF AMENDMENTS

IN THE CLAIMS

Please cancel claims 11-14 without prejudice or disclaimer as to their subject matter, amend claims 17, 22 and 23, and newly add claims 26-34 by this Preliminary Amendment to read as follows:

1 17. (Amended) The ink-jet printhead of claim 15, wherein each one of said plurality of
2 heaters is adjacent to corresponding ones of said plurality of holes perforating said substrate, each
3 one of said plurality of heaters being disposed on said front side of said substrate, each corresponding
A' 4 ones of said plurality of heaters and each one of said plurality of holes perforating said front side of
5 said substrate being aligned to a corresponding one of said plurality of holes perforating said nozzle
6 plate.

1 22. (Amended) The ink-jet printhead of claim 21, a portion of each one of said plurality of
2 nozzle holes near said bottom side of said nozzle plate being cylindrical while portions of each one
3 of said plurality of nozzle holes near said top side of said nozzle plate being conical in shape.

A² 4 23. (Amended) A method for mass production of a large number of printheads, comprising
2 the steps of:
3 etching a channel into a bottom side of a silicon substrate;
4 etching a plurality of holes on a bottom of said channel of said substrate to perforate said

5 substrate;

6 depositing a first plurality of signal lines and a second plurality of signal lines on a front side
7 of said silicon substrate, each one of said first plurality of signal lines terminating near termination
8 points of corresponding ones of said second plurality of signal lines, each of said terminating
9 portions of said first and said second signal lines terminating near at least one of said plurality of
10 holes perforating said substrate;

11 depositing a resistive material so as to connect terminating ends of each one of said first
12 plurality of signal lines with corresponding ones of said second plurality of signal lines, said resistive
13 material being near at least one of said plurality of holes perforating said substrate; and

14 attaching a nozzle plate perforated by a plurality of nozzle holes onto said front side of said
15 substrate so that each one of said plurality of nozzle holes is aligned to corresponding ones of
16 terminating ends of said first and said second signal lines, said resistive material, and at least one of
17 said plurality of holes perforating said substrate.

1 --26. The ink-jet printhead of claim 1, said ink-jet printhead being mass manufactured by
2 a process comprising the steps of:

3 etching said channel into a rear surface of said substrate;

4 etching a plurality of holes through to said front surface of said substrate to perforate said
5 substrate;

6 depositing a first plurality of signal lines and a second plurality of signal lines on said front
7 surface of said substrate, each one of said first plurality of signal lines terminating near termination

8 points of corresponding ones of said second plurality of signal lines, each of said terminating
9 portions of said first and said second signal lines terminating near at least one of said plurality of
10 holes perforating said front surface of said substrate;

11 depositing said heaters made of a resistive material onto said front surface of said substrate
12 so as to said connect terminating ends of each one of said first plurality of signal lines with
13 corresponding terminating ends of said second plurality of signal lines, said resistive material being
14 near to at least one of said plurality of holes perforating said front surface of said substrate; and

15 attaching said nozzle plate perforated by said plurality of nozzle holes onto said front surface
16 of said substrate so that each one of said plurality of nozzle holes is aligned to corresponding ones
17 of terminating ends of said first and said second signal lines, said resistive material, and at least one
18 of said plurality of holes perforating said front surface of said substrate.

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27. The ink-jet printhead of claim 26, said resistive material being essentially omega in
2 shape and surrounding corresponding ones of said plurality of holes perforating said front surface
3 of said substrate.

1 28. The ink-jet printhead of claim 26, said plurality of holes perforating said front surface
2 of said substrate occur in pairs so that corresponding ones of said first and said second signal lines
3 terminate in the vicinity of a pair of holes perforating said front surface of said substrate, each one
4 of said plurality of nozzle holes being positioned over said pair of holes perforating said front surface
5 of said substrate.

1 29. The ink-jet printhead of claim 17, said ink-jet printhead being mass manufactured by a
2 process comprising the steps of:
3 etching said channel into said back side of said substrate;
4 etching said substrate to produce said plurality of holes that perforate said front side of said
5 substrate;
6 depositing a first plurality of signal lines and a second plurality of signal lines on said front
7 surface of said substrate, each one of said first plurality of signal lines terminating near termination
8 points of corresponding ones of said second plurality of signal lines, each of said terminating
9 portions of said first and said second signal lines terminating near at least one of said plurality of
10 holes perforating said front side of said substrate;
11 depositing said plurality of heaters made of a resistive material onto said front surface of said
12 substrate so as to said connect terminating ends of each one of said first plurality of signal lines with
13 corresponding terminating ends of said second plurality of signal lines, said resistive material being
14 near to at least one of said plurality of holes perforating said front side of said substrate; and
15 attaching said nozzle plate perforated by said plurality of nozzle holes onto said front side
16 of said substrate so that each one of said plurality of nozzle holes are aligned to corresponding ones
17 of terminating ends of said first and said second signal lines, said resistive material, and at least one
18 of said plurality of holes perforating said front side of said substrate.

1 30. The ink-jet printhead of claim 29, said resistive material being essentially omega in

2 shape and surrounding corresponding ones of said plurality of holes perforating said front side of
3 said substrate.

1 31. The ink-jet printhead of claim 29, said plurality of holes perforating said front side of
2 said substrate occur in pairs so that corresponding ones of said first and said second signal lines
3 terminate in the vicinity of a pair of holes perforating said front side of said substrate, each one of
4 said plurality of nozzle holes being positioned over said pair of holes perforating said front side of
5 said substrate.

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1 32. The ink-jet printhead of claim 19, said ink-jet printhead being mass manufactured by a
2 process comprising the steps of:

3 etching said channel into said back side of said substrate;

4 etching said substrate to produce said plurality of holes that perforate said front side of said
5 substrate;

6 depositing a first plurality of signal lines and a second plurality of signal lines on said front
7 surface of said substrate, each one of said first plurality of signal lines terminating near termination
8 points of corresponding ones of said second plurality of signal lines, each of said terminating
9 portions of said first and said second signal lines terminating near at least one of said plurality of
10 holes perforating said front side of said substrate;

11 depositing said plurality of heaters made of a resistive material onto said front surface of said
12 substrate so as to said connect terminating ends of each one of said first plurality of signal lines with

13 corresponding terminating ends of said second plurality of signal lines, said resistive material being
14 near to at least one of said plurality of holes perforating said front side of said substrate; and
15 attaching said bottom side of said nozzle plate perforated by said plurality of nozzle holes
16 onto said front side of said substrate so that each one of said plurality of nozzle holes are aligned to
17 corresponding ones of terminating ends of said first and said second signal lines, said resistive
18 material, and at least one of said plurality of holes perforating said front side of said substrate.

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2 33. The ink-jet printhead of claim 32, said resistive material being essentially omega in
3 shape and surrounding corresponding ones of said plurality of holes perforating said front side of
said substrate.

1 34. The ink-jet printhead of claim 32, said plurality of holes perforating said front side of
2 said substrate occur in pairs so that corresponding ones of said first and said second signal lines
3 terminate in the vicinity of a pair of holes perforating said front side of said substrate, each one of
4 said plurality of nozzle holes being positioned over said pair of holes perforating said front side of
5 said substrate.--